Installation Instructions

HP StorageWorks Replacing DIMMs in HSG60 and HSG80 Cache Modules

Read instructions completely before beginning the installation procedure

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Replacing DIMMs in HSG60 and HSG80 Cache Modules
Installation Instructions
Fifth Edition (March 2005)
Part Number: EK-80DIM-IM. E01

About these instructions

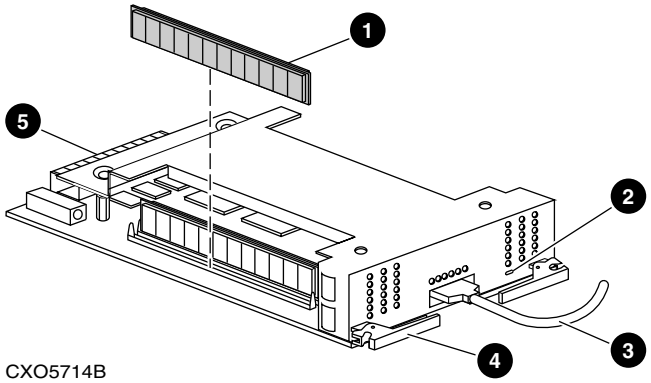
This document contains instructions for replacing or upgrading dual inline memory modules (DIMMs) in a cache module for HP StorageWorks HSG60 and HSG80 subsystems.

Note: For instructions on upgrading a single-controller configuration to a dual-redundant controller configuration, refer to the appropriate array controller user guide or maintenance and service guide.

Procedures in these instructions include:

General information

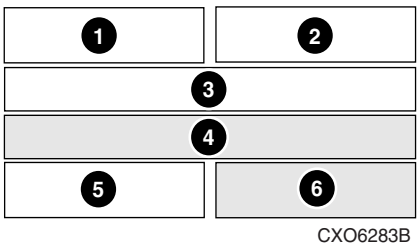
Figure 1, Figure 2, and Figure 3 (on page 2) provide general information about the cache module.



❶ DIMM
❷ Cache memory power LED
❸ External cache battery (ECB) Y-cable (not used on Model 2100 and 2200 enclosures)
❹ Retaining lever
❺ Backplane connector

Figure 1: Cache module

Note: In Figure 2, the environmental monitoring unit (EMU) and power verification assembly (PVA) modules only exist in HP StorageWorks BA370 enclosures. The controller and cache module locations are consistent with other HP StorageWorks controller enclosures.



❶ EMU (BA370 enclosure only)
❷ PVA (BA370 enclosure only)
❸ Controller A
❹ Controller B
❺ Cache A
❻ Cache B

Figure 2: Cache module locations

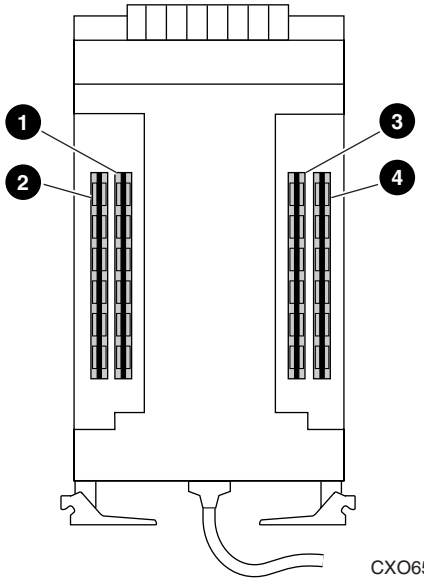


Figure 3: Cache module DIMM locations

Table 1: Valid cache module memory configurations

Memory	DIMMs	Quantity	Location			
128 MB	32 MB	4	❶	❷	❸	❹
256 MB	128 MB	2		❶	❸	
512 MB	128 MB	4	❶	❷	❸	❹

Note: The cache size requirement for running ACS V8.8-*x*P or V8.8-*x*S is 512 MB. For ACS V8.8-*x*F, V8.8-*x*G, and V8.8-*x*L, the minimum cache size requirement is 128 MB in unmirrored configurations and 256 MB in mirrored configurations, per cache module.

Cache memory configuration

Regardless of the array controller software (ACS) version, in dual-redundant configurations, both cache modules *must* contain the same memory configuration.

If you are upgrading the current cache configuration to increase memory, make sure the cache module memory configuration is valid (see Table 1).

Note: Failure to upgrade cache memory appropriately can result in an inoperable controller and increase subsystem down-time.

Upgrading a cache memory configuration requires the storage subsystem to be shutdown. For single-controller configurations, a shut down is expected. In dual-controller configurations, because each cache module must contain the same memory configuration, both controllers must be shut down during the replacement period for the second controller.

If subsystem downtime is not crucial, HP recommends using the applicable single-controller configuration procedure for the specific controller type to replace the DIMMs.

Replacing an HSG60 and HSG80 DIMM in single-controller configurations

Use the steps in "Removing DIMMs" and "Installing DIMMs" to replace DIMMS in a cache module.

Caution: Static electricity can easily damage a cache module or a DIMM. Wear a snug-fitting, grounded electrostatic discharge (ESD) wrist strap.

Note: If a DIMM fails, note which DIMM needs replacement based on the diagram displayed on the console. ACS displays the following CLI messages if a DIMM failure is detected:

```
1. %CER--DebugTop> --18-MAY-2005 10:50:47--
Cache module DIMM 2 failed

2. %EVL--DebugTop> --18-MAY-2005 10:50:58--
Instance Code: 02623801 (not yet reported to
host)

DIMM     Instance Code

DIMM-1 = 02613801

DIMM-2 = 02623801

DIMM-3 = 02633801

DIMM-4 = 02643801
```

Refer to *HP StorageWorks HSG60 and HSG80 Array Controller and Array Controller Software Troubleshooting Guide* for cache policies information that to determine which cache module and DIMM are at fault.

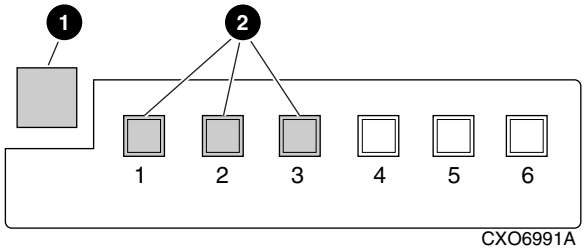
Removing DIMMs

Use the following steps to remove DIMMs from a cache module in single-controller configurations:

1. Determine whether the controller is operational:
   - If the controller is operational, connect a PC or terminal to the controller maintenance port.
   - If the controller is not operational, Go to step 6 on page 3.
2. From the host console, stop all host activity to the controller, and then dismount the logical units in the subsystem.
3. If using a Microsoft® Windows 2000 or Windows NT® platform, shut down the server.
4. Run the *Fault Management Utility (FMU)* to obtain the last failure codes, if desired.
5. Shut down "this controller" with the following command:

   ```
   SHUTDOWN THIS_CONTROLLER
   ```

Note: After the controller shuts down, the **Reset** button and the first three port LEDs turn on (see Figure 4 on page 3). This can take several minutes depending on the amount of data that needs to be flushed from the cache module.



❶ Reset button ❷ First three port LEDs

Figure 4: Controller Reset button and first three port LEDs

Note: For HP StorageWorks Model 2100 and 2200 enclosures, omit step 6 and step 7. The ECB does not contain switches or use ECB Y-cables.

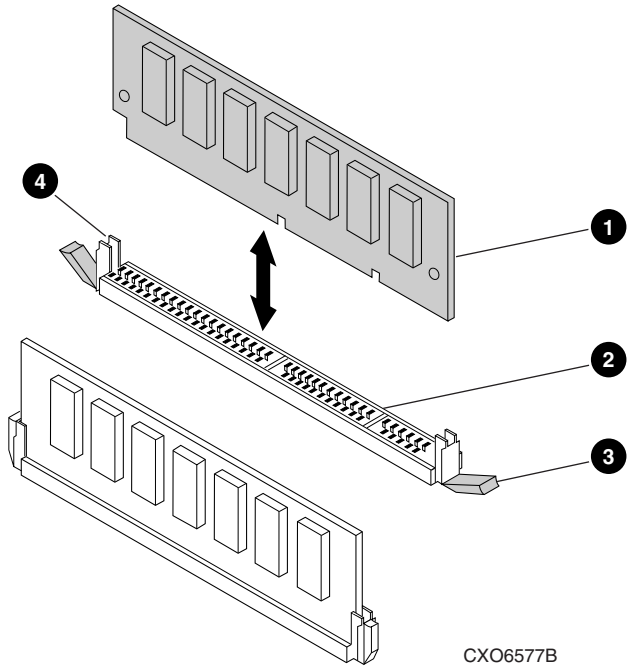
Caution: You must disable the ECB before disconnecting the ECB Y-cable from the cache module. Failure to disable the ECB can damage the cache module.

6. Disable the ECB by pressing in the battery disable switch while removing the ECB Y-cable from the cache module.
7. Release the battery disable switch.
8. Disengage both retaining levers, remove the cache module, and then place the cache module on an antistatic bag or a grounded antistatic mat.

Note: You must remove the DIMMs for installation in the replacement cache module.

9. Note the location of each DIMM in the old cache module and install the DIMMs in same location of the replacement cache module.
10. Press down on the DIMM retaining clips (see Figure 5) at both ends of the DIMM being removed.

Note: To facilitate pressing down on the DIMM retaining clips, use the eraser end of a pencil or a small screwdriver.



❶ DIMM ❸ DIMM retaining clips
❷ DIMM slot ❹ Rail guide

Figure 5: Removing or installing a DIMM

11. Gently remove the DIMM from the DIMM slot, and then place it in an antistatic bag or on a grounded antistatic mat.
12. Repeat step 10 and step 11 for each DIMM being replaced.

Installing DIMMs

Use the following steps to install DIMMs in a cache module in single-controller configurations:

Note: Before installing DIMMs, note the following:

- New cache modules have no DIMMs installed; the DIMMs are packaged separately. Unpack the DIMMs and install them into the cache module as required.
- Both cache modules *must* contain the same memory configuration for the ACS version. See Figure 3 and Table 1 on page 2 for valid cache module memory configurations.
- Some HSG80 controller configurations require a 512-MB cache memory configuration. Make sure the cache memory configuration meets or exceeds the ACS requirement. See "Cache memory configuration" on page 2.

1. Insert each DIMM (see Figure 5) straight into the appropriate slot of the cache module, ensuring that the notches in the DIMM align with the tabs in the slot.
2. Press the DIMM gently into the slot until seated at both ends.
3. Engage the two retaining clips for the DIMM (see Figure 5).
4. Make sure both ends of the DIMM are firmly seated in the slot and both retaining clips engage the DIMM.
5. Repeat step 1 through step 4 for each DIMM.

6. Carefully align the cache module in the appropriate guide rails.

Caution: Misalignment can damage the backplane.

7. Insert the cache module into the appropriate bay and engage the retaining levers.

Note: For HP StorageWorks Model 2100 and 2200 enclosures, omit step 8 and step 9. The ECB does not contain switches or use ECB Y-cables.

Caution: You must disable the ECB before disconnecting the ECB Y-cable from the cache module. Failure to disable the ECB can damage the cache module.

8. If not already done, disable the ECB by pressing the battery disable switch for approximately 5 seconds.
9. Connect the ECB Y-cable to the cache module.
10. If not already connected, connect a PC or terminal to the controller maintenance port.
11. Restart the controller by pressing the **Reset** button.

Note: A controller restart can take as long as 60 seconds, indicated by the temporary cycling of the port LEDs and a flashing **Reset** button.

Note: If the controller did not restart, use the following steps:

a. Press and hold the controller **Reset** button.
b. Reseat the controller program card.
c. Release the **Reset** button.

12. From the CLI prompt, display details about the configured controller using the following command:

```
SHOW THIS_CONTROLLER FULL
```

13. Set the date and time by using the following command, if necessary:

```
SET THIS_CONTROLLER TIME=dd-mm-yyyy:hh:mm:ss
```

14. Mount the logical units on the host.
15. For Windows 2000 or Windows NT platform users, restart the server.
16. Disconnect the PC or terminal from the controller maintenance port.

Replacing an HSG60 and HSG80 DIMM in dual-redundant controller configurations

Use the steps in "Removing DIMMs" and "Installing DIMMs" to replace DIMMS in a cache module:

Caution: Static electricity can easily damage a cache module or a DIMM. Wear a snug-fitting, grounded electrostatic discharge (ESD) wrist strap.

Note: If a DIMM fails, note which DIMM needs replacement based on the diagram displayed on the console. ACS displays the following CLI messages if a DIMM failure is detected:

```
1. %CER--DebugTop> --18-MAY-2005 10:50:47--
Cache module DIMM 2 failed

2. %EVL--DebugTop> --18-MAY-2005 10:50:58--
Instance Code: 02623801 (not yet reported to
host)

DIMM     Instance Code

DIMM-1 = 02613801

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DIMM-4 = 02643801
```

Refer to *HP StorageWorks HSG60 and HSG80 Array Controller and Array Controller Software Troubleshooting Guide* for cache policies information that to determine which cache module and DIMM are at fault.

Removing DIMMs

Use the following steps to remove DIMMs from a cache module in dual-redundant configurations:

1. Connect a PC or terminal to the maintenance port of the operational controller.

   The controller connected to the PC or terminal becomes "this controller," and the controller for the cache module being removed becomes the "other controller."

2. Disable failover, and then take the controllers out of the dual-redundant configuration with one of the following commands:

```
SET NOFAILOVER
or
SET NOMULTIBUS_FAILOVER
```

3. Start the *Field Replacement Utility (FRUTIL)* with the following command:

```
RUN FRUTIL
```

4. Enter **N**(o) to the question about replacing the cache battery.
5. Enter **1** to replace or remove a controller or cache module.
6. Enter **3** to replace or remove the "other controller" cache module.
7. Enter **Y**(es) to confirm the intent to remove the "other controller" cache module.
8. Wait for *FRUTIL* to quiesce the device ports—indicated by an "`All device ports quiesced`" message.

Caution: Failure to allow the ports to quiesce can result in data loss. Quiescing can take several minutes.

The ECB must be disabled before disconnecting the ECB cable from the cache module. Failure to disable the ECB might result in cache module damage.

Note: A countdown timer allows a total of 2 minutes to remove the cache module. After 2 minutes, "this controller" exits *FRUTIL* and resumes operations. If this happens, return to step 3 on page 4 and proceed.

9. For HP StorageWorks Model 2100 and 2200 enclosures, disengage both retaining levers and remove the "other controller" cache module.
10. For all other supported enclosures:
    a. Disengage both retaining levers and partially remove the "other controller" cache module—about halfway.

Caution: You must disable the ECB before disconnecting the ECB Y-cable from the cache module. Failure to disable the ECB might damage the cache module.

    b. Disable the ECB by pressing in the battery disable switch while removing the ECB Y-cable from the cache module.
    c. Release the battery disable switch.
    d. Disconnect the ECB cable from the "other controller" cache module.
    e. Remove the cache module from the enclosure.
11. Place the cache module on an antistatic bag or a grounded antistatic mat.
12. Enter **N**(o) to the question for a replacement cache module.

    FRUTIL exits.
13. Press down on the DIMM retaining clips at both ends of the DIMM being removed (see Figure 5 on page 3).

Note: To facilitate pressing down on the DIMM retaining clips, use the eraser end of a pencil or a small screwdriver.

14. Gently remove the DIMM from the DIMM slot, and then place it in an antistatic bag or on a grounded antistatic mat.
15. Repeat step 13 and step 14 for each DIMM being replaced.

Installing DIMMs

Use the following steps to install DIMMs in a cache module in dual-redundant configurations:

Note: Before installing DIMMs, note the following:

- New cache modules arrive without DIMMs installed; the DIMMs are packaged separately. Unpack the DIMMs and install them into the cache module as required.
- Both cache modules *must* contain the same memory configuration for the ACS version. See Figure 3 and Table 1 on page 2 for valid cache module memory configurations.
- Some HSG80 controller configurations require a 512-MB cache memory configuration. Make sure the cache memory configuration meets or exceeds the ACS requirement. See "Cache memory configuration" on page 2.

1. Insert each DIMM (see Figure 5 on page 3) straight into the appropriate slot of the cache module, ensuring that the notches in the DIMM align with the tabs in the slot.
2. Press the DIMM gently into the slot until seated at both ends.
3. Engage the two retaining clips for the DIMM (see Figure 5 on page 3).
4. Make sure both ends of the DIMM are firmly seated in the slot and both retaining clips engage the DIMM.
5. Repeat step 1 through step 4 for each DIMM.
6. If not already connected, connect a PC or terminal to the operational controller.

   The controller connected to the PC or terminal becomes "this controller," and the controller for the cache module being installed becomes the "other controller."
7. Start *FRUTIL* with the following command:

   ```
   RUN FRUTIL
   ```
8. Enter **N**(o) to the question about replacing the cache battery.
9. Enter **2** for the install a controller or cache module option.
10. Enter **3** for the install the "other controller" cache module option.
11. Enter **Y**(es) to confirm the intent to install the "other controller" cache module.
12. Wait for *FRUTIL* to quiesce the device ports—indicated by an "`All device ports quiesced`" message.

Caution: Failure to allow the ports to quiesce can result in data loss. Quiescing can take several minutes.

You must disable the ECB before connecting the ECB cable to the cache module. Failure to disable the ECB might damage the cache module.

Carefully align the cache module in the appropriate guide rails. Misalignment might damage the backplane.

Note: A countdown timer allows a total of 2 minutes to install the cache module. After 2 minutes, "this controller" exits *FRUTIL* and resumes operations. If this happens, return to step 7 and proceed.

13. Follow on-screen instructions to install the cache module and to restart the “other controller.”

Note: A controller restart can take as long as 60 seconds, indicated by the temporary cycling of the port LEDs and a flashing **Reset** button.

Note: If the “other controller” did not restart:

a. Press and hold the “other controller” **Reset** button.
b. Reseat the “other controller” program card.
c. Release the **Reset** button.

Tip: To verify that the “other controller” restarts, connect a PC or terminal to the maintenance port, and then verify that it passed the cache diagnostic test.

Caution: In step 14, entering the appropriate `SET` command is critical. Enabling an incorrect Failover mode can cause loss of data and incur system down time.

Verify the original failover configuration, and use the appropriate `SET` command to restore this configuration.

14. Enable failover and reestablish the dual-redundant configuration with the following command:

```
SET FAILOVER COPY=THIS_CONTROLLER
```
or
```
SET MULTIBUS_FAILOVER COPY=THIS_CONTROLLER
```

This command copies the subsystem configuration from “this controller” to the “other controller.”

15. If desired, verify the failover configuration with the following command:

```
SHOW THIS_CONTROLLER FULL
```

16. Disconnect the PC or terminal from the controller maintenance port.